

DOCKET NO.: WARF-0138 (P98103US)

Application No.: 09/817,762

Office Action Dated: June 3, 2003

PATENT
REPLY FILED UNDER EXPEDITED
PROCEDURE PURSUANT TO
37 CFR § 1.116

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) An isolated nucleic acid encoding a 5-nitro-2-(3-phenylpropylamino) benzoic acid inducible plant p-glycoprotein, which has the nucleic acid having the restriction endonuclease cleavage sites shown in Figure 7 for one or more restriction endonucleases selected from the group consisting of AccI, AclI, AflII, AlwNI, BanI, Bpu10I, BclI, BsaI, BseSI, BsgI, BsiHKA1, BsmI, BspMI, BsrI, BsrDI, BsrFI, BstAPI, BstUI, BstZ17I, ClaI, DraI, DrdI, EaeI, Ecl136II, Eco57I, MspAII, NciI, NlaIV, NspI, PacI, PpuMI, SacI, SanDI, SnaBI, SpeI, TatI, TliI, Tsp45I, Tth111I, XbaI, XcmI, XhoI; and XmnI; wherein the cleavage sites are arranged as in SEQ ID NOs: 1 or 10, and which encodes a wherein the plant p-glycoprotein that is inducible by exposure of a plant to 5-nitro-2-(3-phenylpropylamino) benzoic acid (NPPB).
2. (Previously Presented) The isolated nucleic acid of claim 1, which is expressed in plant roots upon exposure of the plant to NPPB.
3. (Previously Presented) The isolated nucleic acid of claim 1, wherein the plant is *Brassica napus* or *Arabidopsis thaliana* and wherein the nucleic acid is 3850-4150 nucleotides long.
4. (Currently Amended) The isolated nucleic acid of claim 1, which has the restriction endonuclease cleavage sites of SEQ ID NO:1 shown in Figure 7 for at least three restriction endonucleases.

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5. (Original) The isolated nucleic acid of claim 4, which encodes a polypeptide having SEQ ID NO:2.

6. (Previously Presented) The isolated nucleic acid of claim 1, wherein the nucleic acid is a DNA comprising a coding region of SEQ ID NO:1 or SEQ ID NO:10.

7-8. (Cancelled)

9. (Previously Presented) An expression cassette, which comprises a coding sequence of a pIPAC gene operably linked to a promoter.

10. (Original) The expression cassette of claim 9, which comprises a *pIPAC* gene from *Arabidopsis thaliana*.

11. (Previously Presented) The expression cassette of claim 10, wherein the promoter is the cauliflower mosaic virus 35S promoter.

12. (Previously Presented) The expression cassette of claim 10, wherein the pIPAC gene is part or all of SEQ ID NO:1 or SEQ ID NO:10.

13. (Original) A vector comprising the expression cassette of claim 9.

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14. (Original) The vector of claim 13, which is comprised of an *Agrobacterium* binary vector selected from the group consisting of pPZP211 and pCGN7366.

15-16 (Cancelled)

17. (Previously Presented) A transgenic plant comprising the expression cassette of claim 9 wherein the plant has enhanced resistance to xenobiotic compounds.

18. (Previously Presented) A seed from the transgenic plant of claim 17, said seed comprising the expression cassette.

19. (Previously Presented) A cell from the transgenic plant of claim 17, said cell comprising the expression cassette.

20. (Previously Presented) A recombinant DNA molecule comprising the nucleic acid of claim 1, inserted in a vector for transforming cells.

21. (Original) A cell transformed with the recombinant DNA molecule of claim 20.

22. (Original) The cell of claim 21, selected from the group consisting of bacterial cells, yeast cells and plant cells.

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23. (Previously Presented) A transgenic plant regenerated from the transformed plant cell of claim 22.

24. (Currently Amended) An isolated nucleic acid having a sequence selected from the group consisting of:

- a) SEQ ID NO:1 or SEQ ID NO:10;
- b) a nucleic acid sequence that is at least about ~~60%~~ 95% identical to the coding regions of SEQ ID NO:1 or SEQ ID NO:10;
- ~~c) a nucleic acid sequence encoding a p-glycoprotein and hybridizing with SEQ ID NO:1 or SEQ ID NO:10 under conditions comprising hybridization in 6X SSC, 5X Denhardt's solution, 0.5% SDS and 100 µg/ml denatured salmon sperm DNA at 42 C and washing in 2X SSC and 0.5% SDS at 55 C for 15 minutes;~~
- d) ~~c)~~ a nucleic acid sequence encoding a polypeptide having SEQ ID NO:2;
- e) ~~d)~~ a nucleic acid sequence encoding an amino acid sequence that is at least about 70% 95% identical to SEQ ID NO:2;
- ~~f) e)~~ a nucleic acid sequence encoding an amino acid sequence that is at least about 80% ~~similar~~ identical to SEQ ID NO:2; and
- ~~g) f)~~ a nucleic acid sequence encoding a p-glycoprotein comprising an amino acid sequence that is at least about 40% ~~similar~~ 95% identical to residues 1-76, 613-669, or 1144-1161 of SEQ ID NO:2; and
- ~~h) a nucleic acid sequence encoding a p-glycoprotein and hybridizing to a sequence encoding residues 1-76, 613-669 or 1144-1161 of SEQ ID NO:2 under conditions comprising~~

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~~hybridization in 6X SSC, 5X Denhardt's solution, 0.5% SDS and 100 µg/ml denatured
salmon sperm DNA at 42 C and washing in 2X SSC and 0.5% SDS at 55 C for 15 minutes.~~

25-27 Cancelled

28. (Previously Presented) A recombinant DNA molecule comprising the nucleic acid of claim 24, inserted in a vector for transforming cells.

29. (Original) A cell transformed with the recombinant DNA molecule of claim 28.

30. (Original) The cell of claim 29, selected from the group consisting of bacterial cells, yeast cells and plant cells.

31. (Previously Presented) A transgenic plant regenerated from the plant cell of claim 30.

32-45 Cancelled

46. (New) An isolated nucleic acid molecule having a sequence selected from the group consisting of:

- a) SEQ ID NO:1 or SEQ ID NO:10;
- b) a nucleic acid sequence encoding a p-glycoprotein with xenobiotic detoxification activity, wherein the nucleic acid is at least about 95% identical to the coding regions of SEQ ID NO:1 or SEQ ID NO:10;
- c) a nucleic acid sequence encoding a polypeptide having SEQ ID NO:2; and

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d) a nucleic acid sequence encoding a p-glycoprotein with xenobiotic detoxification activity with an amino acid sequence that is at least about 95% identical to SEQ ID NO:2;

47. (New) The isolated nucleic acid of claim 46, which is expressed in a plant upon exposure of the plant to 5-nitro-2-(3-phenylpropylamino) benzoic acid (NPPB).

48. (New) The isolated nucleic acid of claim 47, which is expressed in plant roots upon exposure of the plant to NPPB.

49. (New) The isolated nucleic acid of claim 1, wherein the plant is *Brassica napus* or *Arabidopsis thaliana* and wherein the nucleic acid is 3850-4150 nucleotides long.

50. (New) An expression cassette, which comprises the isolated nucleotide molecule of claim 46 operably linked to a promoter.

51. (New) The expression cassette of claim 50, which comprises a *pIPAC* gene from *Arabidopsis thaliana*.

52. (New) The expression cassette of claim 51, wherein the promoter is the cauliflower mosaic virus 35S promoter.

53. (New) The expression cassette of claim 51, wherein the *pIPAC* gene is about 95% identical to the coding sequence of SEQ ID NO:1 or SEQ ID NO:10.

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54. (New) A vector comprising the expression cassette of claim 50.
55. (New) The vector of claim 54, which is comprised of an *Agrobacterium* binary vector selected from the group consisting of pPZP211 and pCGN7366.
56. (New) A transgenic plant comprising the expression cassette of claim 50 wherein the plant has enhanced resistance to xenobiotic compounds.
57. (New) A seed from the transgenic plant of claim 56, said seed comprising the expression cassette.
58. (New) A cell from the transgenic plant of claim 56, said cell comprising the expression cassette.
59. (New) A recombinant DNA molecule comprising the nucleic acid molecule of claim 46, inserted in a vector for transforming cells.
60. (New) A cell transformed with the recombinant DNA molecule of claim 59.
61. (New) The cell of claim 60, selected from the group consisting of bacterial cells, yeast cells and plant cells.

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62. (New) A transgenic plant regenerated from the transformed plant cell of claim 61.